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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,843	08/30/2001	Tomio Iwasaki	16869S-033100US	2145

20350 7590 08/28/2003

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EXAMINER
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FOURSON III, GEORGE R

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/943,843

Applicant(s)

IWASAKI ET AL.

Examiner

George Fourson

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 14 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 8,9,11 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no disclosure of configuring the gate oxide film to prevent diffusion as recited. Note the discussion on instant page 16, lines 18-22, for example, where it is stated that diffusion occurs.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al.

Hobbs et al suggests on a semiconductor substrate a 5-20 nm titanium dioxide gate dielectric 62 and the combination of 1)Ru or Ir and 2)iridium oxide or ruthenium oxide as 5-25 nm gate electrode material 64 (col.5). The gate electrode would have the properties recited in claim 1, lines 6-8, because the same materials as in the instant invention would be employed. The claim does not require a particular value of coefficient of diffusion or degree of reduction of current leakage.

Claims 3-7,12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al as applied to claims 1 and 2 above, and further in view of Tsunashima et al.

Hobbs et al fails to disclose inclusion of crystallized titanium dioxide or titanium silicate in the gate dielectric. Tsunashima et al suggests use of titanium oxide on titanium silicate gate dielectric [0160]-[0161], for example. The use of crystallized titanium oxide is disclosed [0089].

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Hobbs et al and Tsunashima et al to enable formation of the gate dielectrice of Hobbs et al.

Claim 12 is included in the rejection to the extent that the claim is open to diffusion of the "conductive element".

Claims 8,9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al in as applied to claims 1 and 2 above, and further in view of Gilbert et al.

Hobbs et al fails to disclose incorporation of a ferroelectric capacitor in a circuit structure. Gilbert et al discloses integration of field effect transistors and ferroelectric capacitors to form a FeRAM. It would have been within the scope of one of ordinary skill in the art to combine the teachings of Hobbs et al and Tsunashima et al with the teachings of Gilbert et al to enable formation of the FeRAM of Gilbert et al.

Claims 8,9 and 11 are included in the rejection to the extent that the claims are open to diffusion of the "element".

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hobbs et al and Gilbert et al as applied to claims 8,9 and 11 above, and further in view of Tsunashima et al.

Tsunashima et al is applied as above as suggesting crystallization of the titanium dioxide film of the combination of Hobbs et al and Gilbert et al as applied to claims 8,9 and 11 above.

Applicant argues that Hobbs et al does not contain disclosure to indicate that the invention is directed to a current leakage problem or disclosure of recognizing a current leakage problem. However, it is not necessary for the reference to disclose that the process of the reference is performed to achieve the same goals as applicant or to obtain the same advantages recognized by applicant. It is sufficient that the process suggested by the reference alone or in combination with the remaining references is encompassed by the instant claims.

Applicant argues that Hobbs et al does not disclose that the gate electrode material includes a conductive oxide layer and a metal layer. However, as stated in the office action mailed 3/27/03, the reference discloses combinations of 1)Ru or Ir and 2)iridium oxide or ruthenium oxide (col.5, lines 12-30).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

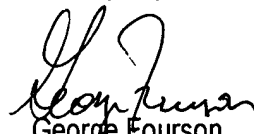
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See MPEP 203.08.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner George Fourson whose telephone number is (703) 308-2544. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794. The fax number for this group is (703)308-7722 (or extensions 7724, 3431 or 3432) for regular communications and (703)308-7382 for after final communications.

  
George Fourson  
Primary Examiner  
Art Unit 2823

GFourson  
August 25, 2003